Income Smoothing and Corporate Governance

Suavização de Resultados e Governança Corporativa

Flávio Leonel Carvalho[1]
Universidade Federal de São Carlos – UFSCar
flcleonel@gmail.com

Eric Henry Tago-Gomes[1]
Universidade Federal de São Carlos – UFSCar
erichenrytago@hotmail.com

Aparecido Vieira Aranha[1]
Universidade Federal de São Carlos – UFSCar
cido_vieira@hotmail.com

Cecília Pereira Sassi[2]
Universidade de São Paulo – USP
cissasassi@gmail.com

Abstract: Income smoothing is a strategy aimed at altering accounting results in order to reduce fluctuations. On the other hand, by adopting corporate governance mechanisms, it may be possible to reduce information asymmetry and, consequently, reduce the possibility of smoothing results. The general objective of the present study was to investigate the relationship Leuz between the adoption of corporate governance mechanisms and income smoothing. Thus, the study investigates whether the group of firms adhering to the corporate governance levels had a smaller proportion of companies that smooth results. Financial data were selected from 211 Brazilian public companies between 2000 and 2015. The firms were separated according to whether or not they adhered to B3's differentiated corporate governance segments. Income smoothing was measured using both the model by Eckel (1981) and a version of the model proposed by Leuz et al. (2003). The analysis was performed using non-parametric Wilcoxon rank sum tests and descriptive analyses. Based on the descriptive analysis, it was not possible to state that the group of firms adhering to the corporate governance levels had a smaller proportion of companies that smooth results; and the hypothesis that the degree of

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[1] Universidade Federal de São Carlos - Rodovia João Leme dos Santos, KM 110 – CEP 18052-780 – Sorocaba (SP) - Brasil
[2] Universidade de São Paulo — Rua da Reitoria, 374 – CEP 05508-220 – São Paulo (SP) – Brasil

income smoothing is lower for such companies was not confirmed. The assumption that levels of corporate governance reduce the possibility of income smoothing was not validated based on non-parametric tests. It was concluded that the proportion of companies that smooth results, and the degree of smoothing by organizations following the B3's corporate governance levels are not lower than the ones shown by companies that do not follow the levels.

Keywords – Corporate Governance; Income Smoothing; Accounting information.

Resumo: A suavização de resultados consiste em uma estratégia com a finalidade de alterar o resultado contábil de modo a reduzir suas flutuações. A adoção de mecanismos de governança corporativa pode reduzir a assimetria de informações e, consequentemente, reduzir a possibilidade de suavização de resultados. O objetivo geral do presente estudo foi investigar o relacionamento entre a adoção de mecanismos de governança corporativa e a suavização de resultados. Assim, foi investigado se o grupo de empresas aderentes aos níveis de governança corporativa apresentou uma proporção menor de empresas que alisam resultados. Foram selecionados dados financeiros de 211 empresas brasileiras de capital aberto entre 2000 e 2015. As firmas foram separadas conforme a adesão ou não aos segmentos diferenciados de governança corporativa da B3. A suavização dos resultados foi mensurada por meio do modelo de Eckel (1981) e uma versão adaptada do modelo de Leuz et al. (2003). Realizou-se a análise por meio de testes não paramétricos de Soma dos Ranks de Wilcoxon e análises descritivas. Com base na análise descritiva, não se pode afirmar que a proporção de empresas suavizadoras de resultados é menor para o grupo de firmas pertencentes aos níveis de governança corporativa; não se confirmou a hipótese de que o grau de suavização de resultados para tais empresas é menor. A suposição de que os níveis de governança corporativa reduzem a possibilidade de suavização de resultados não foi validada. Conclui-se que a proporção de empresas suavizadoras de resultados, assim como o grau de suavização das organizações pertencentes aos níveis diferenciados de governança, não são menores aos do grupo das demais empresas.

Palavras-chave – Governança Corporativa; Suavização de Resultados; Informação Contábil.

Introduction

On account of the organization's growth, especially since the role of management was dissociated from the figure of the company owner, information asymmetry would be constitute an issue, which concerns the knowledge of data and privileged information by some members of the body of stakeholders. This problem has already been pointed by Adam Smith (s.d.), for whom the separation between ownership and control could be a problem, considering that sometimes the managers have incentives to operate the

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corporation in an inefficient manner trying to maximize their personal utility. This phenomenon was called Agency Problem by Jensen and Meckling (1976) and the effort and the costs to reduce them, Agency Cost. In order to mitigate its effect, companies have adopted corporate governance mechanisms aiming at greater transparency in the process of business management and at reducing information asymmetry.

Income smoothing, in turn, consists of a strategy aimed at altering the accounting result, by rising it in some periods and lowering it in others to reduce fluctuations with a view to achieving a specific goal. This means that the quality of the accounting information disclosed to the market is tampered with Castro (2008). Investors and creditors understand the spread of accounting results as a measure of risk. For this reason, corporations exhibiting lower fluctuations in their accounting results tend to attract more investors, as well as obtain lower-cost loans (Castro, 2008; Castro & Martinez, 2009; Healy & Wahlen, 1999; Zendersky, 2005). This perception, according to Castro and Martinez (2009), may encourage managers to make the result less volatile by smoothing the growth flow.

In this context, it is possible to assume that since adopting corporate governance mechanisms reduce informational asymmetry, it may inhibit managers' discretionary behaviour, and thus companies following differentiated levels of corporate governance may have a lower probability of smoothing results. Therefore, it can be assumed that organizations with high levels of corporate governance tend not to smooth their results; in other words, the practice of smoothing results may be inhibited by the adoption of governance mechanisms. In this scenario, the present study seeks to elucidate the following research question: is there a relationship between the adoption of corporate governance mechanisms and the minimization of the practice of smoothing results? In Brazil, few studies have analysed the existence of a relationship between the adoption of corporate governance mechanisms and the problem of smoothing results, which motivates this work. Between then it is possible to cite Lyra and Moreira (2011), Konraht et al. (2016)) and Nazário Sobrinho and Francisco, (2021) that studied the relation between corporate governance and income smoothing. To Lyra and Moreira and Konraht et al. enterprises that belong and not belong to the corporate governance segments practice the income smoothing at the same proportion and degree. Nazário Sobrinho and Francisco (2021), on a sidenote, affirms that the group of companies listed at levels N1, N2 and NM manage the result in a smaller proportion than those at the traditional level.

Assuming that companies' adherences to B3's differentiated levels of governance are companies with high governance standards and considering the conflicting conclusions from the papers cited above, the end of this study is to investigate the relationship between adopting corporate governance mechanisms and the practice of smoothing results in Brazil. In order to achieve that, models by Eckel (1981) and Leuz et al. (2003) were used to determine the presence of smoothing results. As to Corporate Governance, the adherences to B3's differentiated levels of governance by Brazilian publicly traded companies were adopted as a proxy for the adoption of the mechanisms. The sample for the study was composed of Brazilian publicly traded companies. Next is the bibliographic review, followed by the methodology, analysis of results and final considerations.

Literature Review

The objective of this paper is to investigate whether the group of firms adhering to the corporate governance levels had a smaller proportion of companies that smooth results. In order to identify theoretical foundations of this subject, and relevant articles, the research was conducted in a way which highlighted the following key terms "Income Smoothing" and "Corporate Governance" directly on the Scopus (Elsevier) and Web of Science platforms using a bibliometric resource Bibliometrix to select the main papers and to process the obtained data. The records were filtered by type of document, name of the articles, reviews, and editorials, excluding articles published in congress channels, book chapters, conference reviews, books, errata. The language was limited to English and Portuguese and the type of source criterion, filtered by the journal, was used. The two repositories used were consolidated and papers in duplicity were excluded. The final database was composed for 77 papers that explore these matters: corporate governance and income smoothing, together. It is of significant note that that part of the research developed in Brazil is published outside from the repositories mentioned above, and because of it, it was necessary to explore additional repositories, like Scielo and resources as Scholar Google, to improve the literature review.

Theoretical foundation

With aim of obtaining the theoretical pillars of the subject and to identify the most cited papers were analysed in the sample by a cocitation network, using for that the Bibliometrix, that is a R-tool for comprehensive science mapping analysis. Between the ten most cited papers, the older papers are Grant et al. (2009), Machuga and Teitel (2009) and Huang et al. (2009). Grant et al. investigated the relationship between risk-related incentives of executive stock option compensation plans and income smoothing. Machuga and Teitel analysed whether or not board characteristics other than compliance with board independence are associated with the improvement in earnings quality. For that, the earnings quality was measured using income smoothing, timely loss recognition and conditional accruals. Huang et al. examined the impact of artificial smoothing and real smoothing on firm value. According to the authors, the value of the firm decreases with the magnitude of abnormal accruals and increases with the level of derivative use. The conclusion was that managers might use artificial techniques to improve the income stream to expropriate minority shareholders. Furthermore, Huang et al. suggest that poor corporate governance motivates the use of abnormal accruals.

In 2011, the most cited papers related to the present objective were AbuGhazaleh et al. (2011), Leary and Michaely (2011) and Prencipe et al. (2011). AbuGhazaleh et al. investigated the association between recognition of goodwill impairment for UK listed firms in the immediate IFRS adoption period 2005-2006. According to the authors the results indicate that goodwill impairments are strongly associated with effective governance mechanisms. Leary and Michaely analyzed the dividend-smoothing; for them the results suggest that dividend smoothing is most common among firms that are not financially constrained, face low levels of asymmetric information, and are most susceptible to agency conflicts. In turn, Prencipe et al. investigate the relationship between corporate governance dimensions and income smoothing. The study suggested that not only the level of ownership concentration or insider ownership, but also the nature of the dominant shareholder should be considered when addressing the motivations for income smoothing.

Bouvatier et al. (2014) examine whether the way a bank might use loan loss provisions to smooth its income is influenced by its ownership concentration and the regulatory environment. According to the authors, the results confirm that the ownership concentration impacts this decision, and it is influenced by the regulatory environment, this suggests that the importance of corporate governance mechanisms

improvement. Gao and Zhang (2015) showed that income-smoothing firms with higher corporate social responsibility experience higher contemporaneous earnings-return relationship, greater Tobin's Q, and stronger current return-future earnings relationship. As reported by the authors, the findings claim that Corporate Social Responsibility proved desirable as it adds a unique "quality dimension" to earnings attributes and it is useful for firm valuation. And Zagorchev and Gao (2015) examined how corporate governance affects financial institutions. In line with the study, better governance is negatively related to excessive risk-taking and positively related to the performance. Demerjian et al. (2020), by the way, investigate whether high-ability managers are more likely to intentionally smooth earnings. They found that high-ability managers are significantly more likely to engage in intentional smoothing, for that kind of earnings management is associated with improved future operating performance, and according to them, intentional smoothing is more prevalent when the smoothing either benefits shareholders, the manager, or both. In sum, based on research above, it possible to affirm that there is international evidence that corporate governance mechanisms affect the income smoothing.

Corporate governance

As stated in Shleifer and Vishny (1997, p. 737) "corporate governance deals with the ways in which supplies of finance to corporations assure themselves of getting a return of their investments". This implies that the authors' hold the position that investor protection turns out to be crucial because, in many countries, expropriation of minority shareholders and creditors by the controlling shareholders is extensive. La Porta et al. (2000) define corporate governance as a set of mechanisms through which outside investors protect themselves against expropriation by the insiders. For this reason, corporate governance can be understood as a series of mechanisms by which investors are assured against possible expropriation of their assets by managers. According to Martinez and Ramos (2006), corporate governance is composed of stakeholders' practices and relationships (all interested parties) to achieve efficiency and valuation of the company's assets through a set of rules involving transparency, respect for rights, fairness of treatment with shareholders, and accountability, etc.

Pereira et al. (2010) point out three fundamental external and internal reasons that led to the awakening of corporate governance. Among the external factors, it is possible to highlight the following:

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(a) changes in the macro-environment, such as borderless real and financial markets; (b) changes in the business environment such as sectoral restructuring; and (c) revisions in capital market institutions, along with more active stances from institutional investors. Among the internal reasons, the following stand out: (a) societal changes; (b) strategic realignments; and (c) organizational rearrangements, ranging from professionalization to implementation of preventive controls against agency conflicts, information asymmetry, fraud, etc. It should be noted that corporate governance aims, among other things, at avoiding and managing conflicts of interest and the misuse of assets and information related to the organization (Instituto Brasileiro de Governança Corporativa [IBGC], 2015). As stated by Faria et al. (2015), it would be impractical and incomplete to discuss corporate governance without mentioning its four basic principles: (a) transparency, (b) equity, (c) accountability and (d) compliance with laws or corporate responsibility. These principles are contained in documents such as IBGC's Code of Best Corporate Governance Practices and serve as a basis for the special listing segments of B3.

It can be said that the levels and the New Market were designed for companies with a diversified shareholder base through the realization of new public share offerings. Levels 1 and 2 are, so to speak, a kind of preparation of the companies to the New Market, which is, in turn, the highest traded corporate governance representative on B3. In 2005, the segment called *Bovespa Mais* was created. Such segment allows only the trading of common shares. Similarly, *Bovespa Mais* Level 2 was created in 2014 differing from *Bovespa Mais* in that it also deals with preferred shares. It is considered that the "Mais" segments were designed to make the Brazilian stock market accessible to a greater number of companies, especially those with growth potential wishing to enter the capital market in a gradual way, as stated on B3's website (2016). On a rating scale, it is possible to attribute softer levels of corporate governance to such companies. Arranging segments in a continuum, from the softer end of corporate governance to the most sophisticated and demanding end, we have: Bovespa Mais, Bovespa Mais Level 2, Level 1, Level 2 and New Market. In this context, companies belonging to each segment must comply with several rules of corporate governance. And because of that, it is likely to suppose that traded companies that listed in each of these segments have better corporate governance and lower probability of income smoothing.

Income smoothing

Beidleman (1973) mentions that income smoothing can be interpreted as the intentional reduction of abnormal fluctuations in profit, carried out by management, at a level considered normal for the organization, and up to the limit accepted by accounting principles. Eckel (1981) points out that income smoothing can be divided into other typologies, and highlights both natural and intentional smoothing, the latter being divided into real smoothing and artificial smoothing, based on the types of smoothing pointed out by Eckel (1981).

Mendes and Rodrigues (2006) affirm that natural smoothing derives from the process of generation of results, which intrinsically tends to smooth results. On the other hand, intentional smoothing arises from the manager's premeditated decision to use certain procedures with a view to achieving a smoothed result by manipulating accounting variables (artificial smoothing) or real variables (real smoothing).

When addressing results management, Chalayer (1994) points out that this phenomenon may be defined as a set of procedures by which management takes advantage of the flexibility granted by generally accepted accounting principles to achieve a desired degree of profit. Within this subject there is an important aspect called income smoothing, which can be understood as the adoption of mechanisms aimed at reducing the variability of profit to stabilize it over time (Castro, 2008). Healy and Wahlen (1999) allude to that results management may be considered a trick used by managers to mislead stakeholders perception of the company's economic and financial performance and situation when making judgements about structuring operations directly related to accounting reports. Therefore, it can be said that by managing results in the organization's accounting data, the manager intends to "mask" the latter with a view on self-interest. According to Martinez (2001) Income Smoothing, which consists of managing mechanisms to reduce the variability of accounting results, is one of the three existing types of Earnings Management. The other two typologies are Target Earnings, intended to improve or worsen accounting results; and Big Bath Accounting, which aims at reducing current profits in order to be able to increase future profitability (Martinez, 2001).

In this context, Poveda and Iñiguez (2001) indicate that intentional income smoothing derives from a conscious behaviour by the organization's directors. They also emphasize the existence of real and artificial smoothing within intentional income smoothing. In the light of what Zendersky (2005) proposes, it is pertinent to reveal that managers who practice income smoothing in search of personal profitability

usually do so with the intention of attracting new investors, or manipulating the results so that creditors do not perceive the discrepancy in accounting results and loans can be obtained at lower costs, since both investors and creditors perceive excess variation in results as a measure of risk. Ronen et al. (2007) point out that real smoothing involves making production and investment decisions that minimize the variability of accounting results. On the other hand, according to Castro and Martinez (2009), artificial smoothing is obtained by means of accounting choices. Smoothing, as stated by Castro and Martinez, is adopted by the company when the result in advance is high, by lowering the disclosed result, or when the result in advance is low by increasing it.

As forementioned, income smoothing can be understood as an accounting trick with the purpose of masking the results presented by a company. We consider that this technique presents a direct relation with information asymmetry. To counterpose this, corporate governance emerges aiming at the clearest possible exposure of managers' data. When confronting the themes of results smoothing and corporate governance, one notices that they cannot coexist harmoniously, since both have different and opposing positioning regarding asymmetry of results: the first results from asymmetry and the second is contrary to it. Both national and international scholars share similar views to the ones mentioned in this study and have sought to understand the relationship between them.

Torres et al. (2011) verified that companies with higher levels of governance tend to practice income smoothing less than companies that have a more concentrated and controlled ownership structure. Another interesting discovery in their study is that companies use the smoothing artifice on a larger scale when the origin of their capital is national. In a similar study to the present one, Lyra and Moreira (2011) discuss the issue using a sample composed of 90 companies listed on the B3. The authors conclude that even companies following the levels of corporate governance practice income smoothing to the proportion of 20% of the sample, collected between 2007 and 2009. A possible limiting factor of the study referred to the authors is the economic crisis erupted in the North American real estate market in 2008. Yang et al. (2012) refer to the Chinese scenario. The study does not only mention other works that corroborate their line of research, but also works that contradict their study. Thus, this work belongs to the second group, which states that companies that use Corporate Governance mechanisms, such as external audit and meetings with heads of departments, are not effective in monitoring their management of results.

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Also, when analysing the types of smoothing addressed by Eckel (1981), Almeida et al. (2012) there is an emphasis on that smoothing may happen both naturally or intentionally in accounting processes of recognition, measurement and disclosure. The authors point out that intentional smoothing can be divided into real smoothing, which encompasses economic transactions and affects cash flow, e.g, selling a real asset of the company; and artificial smoothing, which implies the use of accruals, i.e., it does not affect cash flow and is not based on economic phenomena, but is similar to a postponement or anticipation of revenues or expenses (Almeida et al., 2012).

Konraht et al. (2016) analysed whether the organizations listed in B3's corporate governance segments were less likely to smooth their results than companies not listed in these segments, and whether the average degree of smoothing by companies not belonging to the group of levels of corporate governance is not greater than that of companies belonging to the group of levels of corporate governance. To achieve this, the researchers studied a sample composed by 249 companies in the period from 2009 to 2013. The results of the study demonstrate that both companies belonging and not belonging to the levels of corporate governance smooth results in the same proportion and intensity. Contrarily, Nazário Sobrinho and Francisco (2021) affirm that the group of companies listed at levels N1, N2 and NM manage the result in a smaller proportion than those at the Traditional level.

As it will be seen later, two out of the four hypotheses of the present study are similar to those of the study by Konraht et al. (2016), but the hypothesis was tested using different statistical procedures. In addition, this research differs from the works by such Lyra and Moreira (2011), Konraht et al. and Nazário Sobrinho and Francisco (2021) because the present study considers a larger period of analysis (between 2000 and 2015), and does not consider of the Bovespa Mais segment of B3's special corporate governance listing segments, and also because these segments are not only analysed in a grouped way like the analysis by Konraht et al. Thus, based on the theoretical framework on the themes, on the available data and on the objective of this research (to investigate the relationship between adopting corporate governance mechanisms – evaluated by the adoption of B3's differentiated levels of corporate governance – and the practice of income smoothing), the hypotheses were formulated as follows:

H1. The proportion of companies that smooth results belonging to corporate governance levels is less than the proportion of companies not belonging to the group of corporate governance levels.

H2. The degree of income smoothing of companies belonging to corporate governance levels is lower than the degree of companies not belonging to corporate governance levels.

H3. Corporate Governance Levels inhibit the income smoothing in companies.

H4. Corporate Governance Levels decrease the degree of income smoothing by companies.

Methodology

In general, the objective of the present study was to analyse the impact of the adoption of corporate governance mechanisms on the practice of smoothing results. For this purpose, we used data from publicly traded companies with shares listed on the B3 up to the date of the survey (November 2016). The database used was constructed with information extracted from the Economatica® system. Information from companies in the "Finance and Insurance", "Funds" and "Other" sectors was excluded from the database to avoid distortions in the analysis. The exclusion of financial companies from the study is a common practice in accounting research, because these companies present a specific accounting plan called COSIF, and those institutions are enforced to follow specific rules. The selected sample comprises the period from 2000 to 2015. Considering that the differentiated levels of corporate governance began to be applied in 2000, we chose to collect data as of that year. As a result, the final research sample consisted of 211 Brazilian companies.

It is also necessary to point out that the way the companies were classified into the two groups: the ones adopting B3's corporate governance segments and the ones not adopting it. Companies that do not adopt it were all grouped into the same category, regardless of whether they were from different economic sectors. The ones adopting it were divided according to the classification proposed by B3, presented earlier. It is worth noting that companies in the "Mais" segments in the sample that had shares traded on B3 as of 2012 were not considered in the study regardless of the segment to which they belonged. In

addition to analysing the entire period from 2000 to 2015, the sample was also analysed in smaller groups of 5 years, and so, since 2015 was the limit year, it would be impossible to form another group from 2012.

In order to classify companies according to their adoption or not of corporate governance mechanisms, the date of inclusion of the firms was included in the groups of companies that opted for the differentiated levels of corporate governance. Consequently, the data was mostly extracted from reports submitted to the Securities and Exchange Commission; namely, Register and Reference Forms, available on B3's website. When not included in the forms, e-mails were sent to the companies' investor relations departments to obtain the dates of entry. Moreover, we also sought to find out about whether companies migrated from one segment to another, in order to ensure the reliability of the results. As for the way in which the dates were used, companies entering up to June of a given year were considered entering in that year. Companies entering from July onwards were considered as entering the following year. Thus, in the binary tabulation built to run the data, companies adhering to the corporate governance segments were given the numeral "1", at the time of their entry. The non-adherents' components of the sample, were given the numeral "0".

Income smoothing identification models

Eckel (1981) and Leuz et al. (2003) were the methods used to determine the presence of income smoothing in the companies observed in this work. According to Konraht et al. (2016), the basic difference between the two methodologies is that the first one identifies if the company practices income smoothing, whereas the second measures the degree of results smoothing. By adopting the two models we aimed at giving the final result more robustness.

The model developed by Eckel (1981) assumes that profit is a linear function of sales, that the ratio between variable costs and sales in monetary units remains constant over time, that fixed costs cannot decrease over time and that gross revenue (sales) can only be smoothed out by real smoothing, i.e., it cannot be smoothed artificially. Thus, in the light of Carlin (2010), the variation coefficient of oscillations in sales is lower than the variation coefficient of oscillations in profit. Eckel argues that when the variability of profit swings is lower than the variability of sales swings, it may be an indication that the firm is artificially smoothing its profit. So:

$$CV\Delta\%_{Net\ profit} \leq CV\Delta\%_{Sales} \rightarrow Smoothing \tag{1}$$

Where:

CV= Coefficient of variation, determined by: $CV(x) = \sigma(x)/\mu(x)$; $\Delta\%_{Net\ profit}$= Annual profit oscillation; $\Delta\%_{Sales}$= Annual sales oscillation

Based on this reasoning, significant works have been published in recent years, such as Abogun et al. (2021), Bhaskoro and Suhardianto (2020), Olojede and Erin (2021), Palupi (2021) and Serrano-Cinca et al. (2019). Abogun et al studied the relationship between income smoothing and firm value in a regulated market. Bhaskoro and Suhardianto has aimed to determine factors that affect income smoothing from the positive accounting theory hypothesis viewpoint. Olojede and Erin investigated the effectiveness of corporate governance mechanisms in reducing creative accounting practices. They concluded that regulatory intervention contributes to effective corporate governance mechanism, which invariably, according to them, minimizes creative accounting practices. Palupi (2021) studied the relationship between income smoothing and earnings announcement. Serrano-Cinca et al. investigated the relationship between accounting anomalies and bankruptcy predictors. Following this study, several indicators proposed in the literature as earnings management indicators present statistically significant differences between failed and non-failed firms, but it does not have enough predictive power to incorporate them into prediction models.

Thus, based in Eckel (1981) model, in which a smoothing measure was calculated as a dimensionless index using the quotient of the coefficients of variation, IE.:

$$IE = \frac{CV\Delta\%_{Net\ profit}}{CV\Delta\%_{Sales}} \tag{2}$$

Where:

IE = Eckel Index

In line with the discussion in the works cited above, an interval between 0.9 and 1.1 was established as "grey area", in which it is not possible to precisely classify the organizations as "smoothing" (companies practising income smoothing) or not "smoothing" (companies not practising income smoothing). Almeida

et al. (2012) state that such procedure allows the objective classification of organizations, reducing the risk of bias on the part of the researcher. Despite this finding, this paper focused on the general understanding of the influence of B3's Corporate Governance levels on the Eckel Index (Eckel, 1981) of the studied companies. Thus, the grey area was only considered in the descriptive analysis of the study and is displayed by the following formula:

$$0,9 \leq \left| \frac{CV\Delta\%_{Net\ profit}}{CV\Delta\%_{Sales}} \right| \leq 1,1 \tag{3}$$

Thus, if the Eckel Index (EI) of a given company is lower than 0.9, the company behaved as smoothing, and if the Index is greater than 1.1, it did not.

Income smoothing identification metrics proposed by Leuz

It is important to highlight that for this study, we used an adaptation of the model by Leuz et al. (2003), proposed by Castro and Martinez (2009). However, we shall first make a presentation of the original model to move then to the scheme applied in this research.

In the original model, according to Tonin (2012), the authors "structured four measures of results management aiming at capturing two dimensions in which administrators can exercise discretion, i.e., measures of income smoothing and measures of discretion of results". Each of the four metrics, called Earnings Management, have a specific purpose. The first (EM1), according to the author, "seeks to identify the variations in economic performance caused by operational decisions and financial disclosure choices". Regarding the second metric (EM2) described by Tonin, (2012), we see a correlation between the accrual regime and the operational cash flow aiming at income smoothing. The third metric (EM3), according to Tonin, aims at detecting the exercise of discretion by the manager in order to misrepresent the economic performance the company. Finally, the fourth metric (EM4), according to Tonin, aims at verifying the influence of accounting standards on results management. Considering that such original construction was not adopted in this work, we chose not to present its formulas.

The version of the model developed by Castro and Martinez (2009) joins Earnings Management into a single formula. Such measure, as the authors point out, is steered at "capturing the degree to which

executives practice smoothing; that is, how they reduce the variability of profit evidenced by the change in the accounting components of profit, i.e., by adjusting the accrual regime" (Castro & Martinez, 2009, p.32). This calculation, in turn, is based on the ratio between the standard deviation of the operating profit and the standard deviation of the operational cash flow, where the latter is extracted by subtracting accruals from the net income. This is shown by the following metric:

$$OperationalCashFlow = Net\ profit - Accruals \tag{4}$$

Where:

$$Accruals = \{[(AC_t - Disp_t) - (PC_t - EmpCP_t)] - [(AC_{t-1} - Disp_{t-1}) - (PC_{t-1} - EmpCP_{t-1})] - Depr\&Amort_t\} \tag{5}$$

Where:

AC_t = Current Assets in the year t; $Disp_t$ = Cash in year t; PC_t = Current Liabilities in the year t; $EmpCP_t$ = Short-Term Loans in t; AC_{t-1} = Current Assets in year t-1; $Disp_{t-1}$ = Cash in year t-1; PC_{t-1} = Current Liabilities in year t-1; $EmpCP_{t-1}$ = Short-Term Loans in t-1; $Depr\&Amort_t$ is depreciations and amortization in year t.

Thus, the general formula is represented by:

$$Smoothing\ index(IS) = \frac{\sigma(Operational\ Prof_{it})}{\sigma(Operational\ Cash\ Flow_{it})} \tag{6}$$

As an interpretative scale for the results obtained, we considered that very low numbers indicate the use of discretion, i.e., the adoption of income smoothing.

Statistical procedures

Regarding the statistical tools used to analyse the data, it is worth noting that we used descriptive parameters composed of mean, median, minimum and maximum values and standard deviation. Considering that it was not possible to use the normal distribution due to the arrangement assumed by the data, we decided to carry out a nonparametric Wilcoxon test, based on non-dependence on population parameters and, therefore, on their estimates. Given the use of this class of test, B3's corporate governance segmentation levels were integrated, i.e., Levels 1, 2 and New Market formed a single analytical group. It is also worth noting that in order to perform the non-parametric tests, specifically the Wilcoxon Rank Sum Test, we used the "R" program, which showed to be a very satisfactory platform to achieve our aim. A

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reliability of 95% was used in the statistical results of non-parametric tests, indicating a significance of 5% (p-value = 0.05).

Analysis of results

Results analysis was carried out by means of descriptive statistics of the sample, based on the Eckel Index (EI) and on the Smoothing Index (SI), in order to understand the behaviour and peculiarities of the sample. Non-parametric tests were also used to understand the influence; in general terms, of Corporate Governance levels on the Eckel Index (Eckel, 1981) and on the Smoothing Index developed by Leuz et al. (2003).

Descriptive statistics of the data based on the Eckel Index

Having a general parameter of the study sample was essential for the research. In this sense, Table 1 shows the descriptive statistics based on the EI of the total sample and on the companies belonging and not belonging to the B3 Corporate Governance Levels (CGL). It can be noted in Table 1 that the average EI (1,012446) of companies belonging to the CGL is lower than the average EI (2,231190) of non-belonging companies. On the other hand, the standard deviation of the non-belonging companies (151,48933) was approximately three times higher than the standard deviation of companies belonging to the CGL (50,47304). The values of the standard deviations in relation to the averages, and the maximum values in relation to the median, presented values that were notoriously high, whereas the minimum values in relation to the medians were significantly lower.

Table 1.
Descriptive statistics of the sample based on the EI – data from 2000 to 2015

Descriptive Analysis of the Sample Based on the Eckel Index (1981)			
Variable	**Total Sample**	**Belonging**	**Non-Belonging**
Average	1,809099	1,012446	2,231190
Standard deviation	126,01267	50,47304	151,48933
Minimum value	-3086,8843	-855,1805	-3086,8843
Median	1,165404	1,305836	1,074696
Maximum value	4060,756439	730,5287	4060,7564

Table 2 shows the descriptive statistics of the total sample based on the EI presented in the periods studied. Table 2 shows that all the data suffered considerable oscillations from one period of analysis to the other. The periods from 2010 to 2014 and 2007 to 2011 draw the most attention, and presented higher and lower average values, respectively, when compared to the other periods. Interestingly, in these two periods the standard deviation and maximum value were the highest values in the analysis period, and the minimum values of both were low. The values of the standard deviations in relation to the averages, and the maximum values in relation to the median presented the same behaviour observed in Table 1, i.e., considerably higher values, and the minimum values in relation to the medians were lower. According to the analysis of smoothing results made by Almeida et al. (2012), the discrepancy in the values does not affect the analysis, and so the EI was used to classify smoothing and non-smoothing companies.

In 2000, 144 organizations were traded on Bovespa (currently B3), among which 34,03% presented smoothing results, 4,86% were classified within the grey area and 61,11% were classified as not smoothing. As the periods analysed increased temporarily, the number of traded companies went from 144 in 2000 to 211 in 2015. It is noted that, despite fluctuations in quantities and proportions from one period to the other, in general, the number of smoothing companies increased, whereas the number of non-smoothing companies suffered a significant decreased. As for the grey area, changes were not significant compared to the first period.

Table 2.
Descriptive statistics of the sample per period based on the EI

Descriptive Analysis of the Total Sample per Period Based on EI					
Period	Average	Standard Deviation	Minimum	Median	Maximum
2011 a 2015	0,6298102	19,09620	-122,77456	0,2179093	132,75457
2010 a 2014	16,0519275	291,45860	-855,18054	0,5209800	4060,75644
2009 a 2013	1,6271362	31,46489	-247,11194	0,9275952	277,56498
2008 a 2012	2,4943162	49,17810	-116,70912	0,5090309	626,25285
2007 a 2011	-11,1175913	268,07100	-3086,88428	1,0969420	730,52866
2006 a 2010	1,8618189	23,30912	-234,67921	1,5359001	126,34415
2005 a 2009	0,6151484	39,42334	-366,78681	1,4049596	293,54928
2004 a 2008	4,3880364	28,15099	-36,19738	1,4081914	341,77295
2003 a 2007	-0,2159161	13,97706	-91,82600	1,2606166	31,33844
2002 a 2006	0,6986425	52,65476	-581,73525	1,5803726	243,35535
2001 a 2005	2,8595480	59,57131	-558,84675	2,0766142	311,29914
2000 a 2004	0,8321280	19,96496	-161,46145	1,8448556	73,44300

Based on the calculated EI of each organization and on these findings, Table 3 shows the quantity and percentage of companies belonging or not belonging to each CGL in the groups of companies considered Smoothing, Non-Smoothing and belonging to the Gray Area.

Table 3.
Descriptive statistics of the sample with data from 2000 to 2015

Period	SAMPLE						Total
	Smoothing		Gray area		Non-Smoothing		
	Amount	(%)	Amount	(%)	Amount	(%)	
2011 a 2015	125	59,24%	11	5,21%	75	35,55%	211
2010 a 2014	114	54,81%	7	3,37%	87	41,83%	208
2009 a 2013	102	49,76%	4	1,95%	99	48,29%	205
2008 a 2012	112	55,17%	4	1,97%	87	42,86%	203
2007 a 2011	95	47,74%	5	2,51%	99	49,75%	199
2006 a 2010	76	39,58%	7	3,65%	109	56,77%	192
2005 a 2009	73	43,45%	2	1,19%	93	55,36%	168
2004 a 2008	61	37,42%	10	6,13%	92	56,44%	163
2003 a 2007	65	41,14%	9	5,70%	84	53,16%	158
2002 a 2006	60	39,22%	4	2,61%	89	58,17%	153
2001 a 2005	52	34,67%	3	2,00%	95	63,33%	150
2000 a 2004	49	34,03%	7	4,86%	88	61,11%	144

Table 4 shows that for all CGLs the percentage of smoothing companies increased in relation to the first (2000 to 2004) and last periods analysed (2011 to 2015). Conversely, the percentage of non-smoothing organizations decreased over the same periods. It is also conceivable to notice some percentage oscillations from one period to the next, and when comparing the percentage of smoothing and non-smoothing companies in equal periods with different CGLs, it can be seen that in most cases, especially in more recent periods, the smoothing companies outnumber the group of non-belonging companies in at least one CGL. Only in the periods from 2002 to 2006, 2003 to 2007 and 2006 to 2010 did the non-belonging group present a higher occurrence of income smoothing than the CGL groups. In this respect, the hypothesis that the proportion of smoothing companies belonging to the CGL is smaller than the proportion of companies not belonging to the group (H1) is rejected. Similarly, the analysis developed by Konraht et al., (2016) indicated that the proportion of smoothing companies in the Traditional group (Non-belonging to the CGL) is not greater than the proportion of companies belonging to the CGL.

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Table 4.
Classification of Companies according to Income Smoothing

PERIOD	SMOOTHING		GRAY AREA		NON- SMOOTHING		TOTAL
	Number	(%)	Number	(%)	Number	(%)	
NEW MARKET							
2011 a 2015	40	56,34%	3	4,23%	28	39,44%	71
2010 a 2014	36	51,43%	5	7,14%	29	41,43%	70
2009 a 2013	33	49,25%	0	0,00%	34	50,75%	67
2008 a 2012	28	43,75%	0	0,00%	36	56,25%	64
2007 a 2011	20	35,71%	2	3,57%	34	60,71%	56
2006 a 2010	13	25,00%	2	3,85%	37	71,15%	52
2005 a 2009	6	19,35%	1	3,23%	24	77,42%	31
2004 a 2008	10	38,46%	1	3,85%	15	57,69%	26
2003 a 2007	4	21,05%	1	5,26%	14	73,68%	19
2002 a 2006	2	18,18%	0	0,00%	9	81,82%	11
2001 a 2005	0	0,00%	0	0,00%	2	100,00%	2
2000 a 2004	0	0,00%	0	0,00%	1	100,00%	1
LEVEL 1							
2011 a 2015	12	60,00%	1	5,00%	7	35,00%	20
2010 a 2014	16	80,00%	0	0,00%	4	20,00%	20
2009 a 2013	11	52,38%	1	4,76%	9	42,86%	21
2008 a 2012	12	57,14%	0	0,00%	9	42,86%	21
2007 a 2011	8	40,00%	0	0,00%	12	60,00%	20
2006 a 2010	4	23,53%	1	5,88%	12	70,59%	17
2005 a 2009	8	50,00%	0	0,00%	8	50,00%	16
2004 a 2008	5	31,25%	1	6,25%	10	62,50%	16
2003 a 2007	5	35,71%	2	14,29%	7	50,00%	14
2002 a 2006	5	38,46%	0	0,00%	8	61,54%	13
2001 a 2005	2	15,38%	0	0,00%	11	84,62%	13
2000 a 2004	0	0,00%	1	8,33%	11	91,67%	12
LEVEL 2							
2011 a 2015	7	63,64%	1	9,09%	3	27,27%	11
2010 a 2014	7	70,00%	0	0,00%	3	30,00%	10
2009 a 2013	4	44,44%	0	0,00%	5	55,56%	9
2008 a 2012	5	62,50%	1	12,50%	2	25,00%	8
2007 a 2011	4	66,67%	1	16,67%	1	16,67%	6
2006 a 2010	2	40,00%	1	20,00%	2	40,00%	5
2005 a 2009	3	75,00%	0	0,00%	1	25,00%	4
2004 a 2008	2	50,00%	0	0,00%	2	50,00%	4
2003 a 2007	2	40,00%	0	0,00%	3	60,00%	5
2002 a 2006	2	40,00%	1	20,00%	2	40,00%	5
2001 a 2005	3	75,00%	0	0,00%	1	25,00%	4
2000 a 2004	1	50,00%	0	0,00%	1	50,00%	2
NON-BELONGING							
2011 a 2015	66	60,55%	6	5,50%	37	33,94%	109
2010 a 2014	55	50,93%	2	1,85%	51	47,22%	108
2009 a 2013	54	50,00%	3	2,78%	51	47,22%	108

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2008 a 2012	67	60,91%	3	2,73%	40	36,36%	110
2007 a 2011	63	53,85%	2	1,71%	52	44,44%	117
2006 a 2010	57	48,31%	3	2,54%	58	49,15%	118
2005 a 2009	56	47,86%	1	0,85%	60	51,28%	117
2004 a 2008	44	37,61%	8	6,84%	65	55,56%	117
2003 a 2007	54	45,00%	6	5,00%	60	50,00%	120
2002 a 2006	51	41,13%	3	2,42%	70	56,45%	124
2001 a 2005	47	35,88%	3	2,29%	81	61,83%	131
2000 a 2004	48	37,21%	6	4,65%	75	58,14%	129

Descriptive statistics of data based on the smoothing index by Leuz

Table 5 presents the descriptive statistics of the total sample, between 2000 and 2015, based on the Smoothing Index (SI) developed by Leuz et al. (2003).

Table 5.
Descriptive statistics of the sample based on the SI – data from 2000 to 2015

SI-based Descriptive Analysis of the Sample			
Variable	**Total Sample**	**Belonging**	**Non-Belonging**
Mean	0,924318	0,818948	0,980147
Standard Deviation	0,947598	0,726339	1,041962
Minimum Value	0,034248	0,034248	0,043666
Median	0,716638	0,635260	0,751931
Maximum Value	16,285708	7,151811	16,285708

In general, it is noted that the mean and standard deviation of the SI of companies belonging to the CGL were lower than the respective variables presented by non-belonging organizations. The fact that the mean is lower denotes that during the analysed period, the degree of income smoothing of companies belonging to the CGL was higher than that presented by the non-belonging companies. In regards to this, the hypothesis that the degree of income smoothing by companies belonging to the CGL is smaller than the degree presented by non-belonging companies (H2) is rejected, since the smaller the SI, the greater the degree of income smoothing. To better evaluate this fact, Table 6 was organized to contrast aspects of the SI presented by both belonging and non-belonging companies in the different periods.

Table 6 shows that for all the CGLs, except New Market, the average SI of the companies increased, indicating that the degree of income smoothing decreased compared to the first (2000 to 2004) and last periods analysed (2011 to 2015). On the contrary, the standard deviation of the SI for New Market

presented lower oscillations than the other groups. Regarding the comparison between periods by groups, only in the period from 2004 to 2008 did the group of non-belonging companies have a lower SI average than all the other groups of organizations belonging to the CGL.

Apart from this, at least one of the groups of the companies belonging to the CGL had a lower SI average than the non-belonging ones. It is also noticed that the degree of income smoothing of companies belonging to the CGL, for the most part, is not lower than those for non-belonging companies. Similarly, the analysis developed by Konraht et al. (2016) also indicated that there is no difference between the average degree of income smoothing between companies listed in the corporate governance segments and those not listed in these segments.

Table 6.
Comparison of the degree of Smoothing Income, based on the SI

Period	Mean	Standard Deviation	Minimum	Median	Maximum
NEW MARKET					
2011 a 2015	0,70887	0,59657	0,11939	0,63260	4,11541
2010 a 2014	0,66089	0,55902	0,09621	0,56023	3,32254
2009 a 2013	0,67021	0,57760	0,05549	0,52304	3,10227
2008 a 2012	0,71973	0,58578	0,03727	0,59465	2,99174
2007 a 2011	0,69296	0,53288	0,03810	0,60391	2,43194
2006 a 2010	0,72230	0,53730	0,03425	0,60505	2,52055
2005 a 2009	0,85413	0,73573	0,18652	0,69263	3,49172
2004 a 2008	0,98626	1,36759	0,12206	0,59139	7,15181
2003 a 2007	0,82261	0,52888	0,18131	0,70430	2,35412
2002 a 2006	1,10602	0,79380	0,07858	1,09530	2,58656
2001 a 2005	0,85138	0,36676	0,59204	0,85138	1,11072
2000 a 2004	0,76935	0,00000	0,76935	0,76935	0,76935
LEVEL 1					
2011 a 2015	1,07865	0,916445	0,06726	0,735108	3,38362
2010 a 2014	0,70435	0,506174	0,07078	0,633857	2,09319
2009 a 2013	1,04006	0,855706	0,07808	0,840085	3,86184
2008 a 2012	1,19727	1,100107	0,10227	1,034695	4,72587
2007 a 2011	0,67697	0,318321	0,07735	0,671089	1,22814
2006 a 2010	0,78701	0,617441	0,09164	0,621626	2,88383
2005 a 2009	0,99059	0,472694	0,23750	0,965918	1,92591
2004 a 2008	0,98059	0,687727	0,19653	0,997185	2,70052
2003 a 2007	1,24733	1,539538	0,18005	0,97504	6,40888
2002 a 2006	1,44497	1,1121	0,17934	1,21432	4,37744
2001 a 2005	0,90631	0,628711	0,12568	0,607952	2,11657
2000 a 2004	0,88917	0,629221	0,15890	0,687096	1,85402
LEVEL 2					

2011 a 2015	1,24275	1,38883	0,09804	0,82726	4,93927
2010 a 2014	0,86718	0,65633	0,05992	0,81634	1,81934
2009 a 2013	0,76044	0,74947	0,07400	0,56846	2,48453
2008 a 2012	0,65070	0,45643	0,09917	0,64661	1,23354
2007 a 2011	0,80520	0,44775	0,38736	0,65194	1,59711
2006 a 2010	0,73975	0,51141	0,30228	0,43226	1,37882
2005 a 2009	0,58433	0,59743	0,08939	0,40296	1,44199
2004 a 2008	0,91641	1,02933	0,32543	0,44118	2,45785
2003 a 2007	0,92235	0,65886	0,20468	0,76325	1,64489
2002 a 2006	1,53446	0,74329	0,70977	1,23855	2,50404
2001 a 2005	0,56020	0,30648	0,33435	0,45053	1,00538
2000 a 2004	0,68613	0,39088	0,40974	0,68613	0,96252
NON-BELONGING					
2011 a 2015	1,31588	2,16618	0,11387	0,71305	16,28571
2010 a 2014	1,04459	0,98137	0,08140	0,77744	6,00703
2009 a 2013	1,05806	1,02866	0,08478	0,77618	5,76706
2008 a 2012	0,88491	0,66334	0,07491	0,72414	4,27445
2007 a 2011	0,82719	0,64354	0,12522	0,67827	4,25587
2006 a 2010	0,86894	0,69718	0,09056	0,75235	4,00191
2005 a 2009	0,93178	1,34216	0,04367	0,70478	13,32424
2004 a 2008	0,84561	0,59800	0,05357	0,70855	4,60715
2003 a 2007	1,02645	0,90640	0,09473	0,77425	5,76086
2002 a 2006	1,17650	1,04680	0,08872	0,90862	7,49516
2001 a 2005	0,92823	0,83652	0,10289	0,76488	6,58537
2000 a 2004	0,88573	0,62600	0,06728	0,74743	3,74758

Non-parametric tests

To verify the third hypothesis (H3), i.e., that the EI is influenced by CGLs, the non-parametric Wilcoxon rank sum test was developed between 2000 and 2015, using data from all the companies belonging to the CGL sample. Table 7 presents the result of this test.

Table 7.
Wilcoxon rank sum test in relation to the EI and CGL

Wilcoxon Rank Sum Test
Data: Eckel Index and Levels of Corporate Governance
W = 522580
p-value = 0,8496
Alternative hypothesis: actual location offset is not equal to 0

According to the results of the Wilcoxon test shown on Table 7, the p-value 0.8496 is greater than the significance level of 0,05. It is also observed that the alternative hypothesis is bilateral, and that the EI is not influenced by the CGL, since the p-value is greater than 0,05. Thus, the hypothesis that the CGL

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inhibits the income smoothing is rejected. Based on the result, but using a different methodology, Lyra and Moreira (2011) denote that companies belonging to the levels of corporate governance were not prevented from smoothing their results, i.e., the EI was not influenced by the CGL.

The same non-parametric test was used to verify whether the SI by Leuz et al. (2003) was influenced by CGLs. The test results can be seen in Table 8.

Table 8.
Wilcoxon Rank Sum Test for SI and CGL

Wilcoxon Rank Sum Test
Data: Smoothing Index by Leuz, Nanda and Wysocki (2003) and Levels of Corporate Governance
W = 588760
p-value = 3.678e-06
Alternative hypothesis: actual location offset is not equal to 0

With respect to the results presented in Table 8, we perceive that that the p-value of approximately zero (3.678e-06) is lower than the level of significance 0.05. This result indicates that the SI is influenced by CGLs, since the p-value is lower than 0.05. Therefore, the hypothesis that Corporate Governance Levels decrease the degree of smoothing in companies (H4) is validated. Despite this finding, the result of Wilcoxon's non-parametric test in relation to the two variables may seem somewhat contradictory to the descriptive analysis of the methodology by Leuz et al. (2003) developed in this work. However, it should be noted that the SI aims at comparing the degree of smoothing of certain groups, and the test carried out was aimed at verifying whether the CGL exert an influence on the SI.

Conclusions

The general objective of this study was to investigate the implications that adopting corporate governance mechanisms have on the inclination of companies to smooth their results. To achieve this, we used data from 211 publicly traded companies, with shares traded on B3 belonging to Levels 1, 2 and New Market, in addition to those not adept to such differentiated segmentations. Regarding the theoretical reference, first we discussed the concepts of corporate governance and income smoothing, which allowed us to approach some studies related to both thematic in order to raise appropriate hypotheses about them.

On the topic of the calculation basis, the models proposed by Eckel (1981) and Leuz et al. (2003) were used, the latter having been adapted by Castro and Martinez (2009). Although the adoption of the two models was, a priori, a strategic factor aiming at ensuring the promptness of the data handled, this decision ended up making it difficult or, in a certain way, contradicting the analysis of the previous section, since both models were expected to move in the same direction, i.e., they were expected (or not) to be relevant to the phenomenon under study at the same time. However, this dissonance among the models used does not represent methodological flaws, since models evaluate the presence of income smoothing based on different assumptions, leading to different results.

Thus, returning to the hypotheses raised during the course of the study, based on the descriptive analysis of the sample, it cannot be stated that the proportion of smoothing companies belonging to the corporate governance levels is smaller than the proportion of companies not belonging to the corporate governance levels (H1). Likewise, the research did not confirm that the degree of income smoothing of companies belonging to corporate governance levels is lower than the degree of companies not belonging to the CGL (H2). Similarly, through a non-parametric test between the index developed by Eckel (1981) and the levels of corporate governance, the hypothesis that such levels inhibit smoothing of firms' results (H3) was not validated. Through non-parametric testing, the assumption that the levels of corporate governance influence the degree of smoothing of company results by decreasing it (H4) was not rejected. For this reason, the research question – is there is a relationship between the adoption of corporate governance mechanisms and the minimization of the practice of smoothing results? - was answered. Based on the results of the present study, and assuming that companies adhering to B3 different levels of corporate governance have a high standard of governance, it is not possible to state that there is evidence of this relationship.

Two important limitations of the present study need to be highlighted. First, the assumption that companies adherences to B3's differentiated levels of governance are companies with high governance standards. The second limitation is the non-distinguishment of information for periods prior to, and subsequent to, the adoption of accounting information to international accounting standards. The implementation of IFRS from 2010 onwards may have impacts on income smoothing, but this aspect was not analyzed in this study. Thus, it is necessary to evaluate the impact of adherence to international

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standards on smoothing results and verification of the companies' governance quality adhering to differentiated levels of corporate governance in future research.

Finally, as a recommendation and, at the same time, scientific curiosity regarding the conclusions drawn by this research, in view of the contrary course presented by the models used, future research could conduct new tests using other models for capturing income smoothing, since depending on the results that arise, a new front might be opened for exploration: a study analysing and comparing the assertiveness of the methods.

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